

TOBACCO INDUSTRY RESEARCH COMMITTEE
150 EAST FORTY SECOND STREET NEW YORK 17, N. Y.

Application For Research Grant

Date: April 4, 1958

1. Name of Investigator: Charles B. McCants *Ph.D.*
2. Title: Arsenic content of soils and absorption by the tobacco plant
3. Institution Department of Soils
& Address: North Carolina State College
Raleigh, North Carolina

- Since cancerous conditions have been developed through the use
4. Project or Subject: of arsenic, the deduction has been made that arsenic inhaled in cigarette smoke is a contributing factor in the development of cancer. It has been further hypothesized that tobacco absorbs appreciable quantities of arsenic from the soil. The objectives of this study are:
1. To determine the arsenic content and distribution in soils used in the production of flue-cured tobacco.
 2. To study the arsenic absorption by tobacco from soils as it is influenced by soil type, by the arsenic content of the soil and by fertility practices.
 3. To study the effect of certain soil properties on the retention of
5. Detailed Plan of Procedure (Use reverse side if additional space is needed): arsenic in the soil.

The experimental procedure will be, in general, a continuation and amplification of that outlined in "Application for Research Grant", February 20, 1957.

Field experiments were initiated in 1957 on three soil types typical of those used in flue-cured tobacco production. In each experiment there are seven variables with respect to applied arsenic. The experiments will be continued on the same sites in 1958, but no additional arsenic will be applied to the soil and none used on the plants. To each of the arsenic variables will be applied two rates of phosphorus in 1958. Soil and plant samples will be taken periodically during the year from each treatment and from all locations. Data from these samples will provide information on the residual effects of arsenic applied in 1957 and on the influence of phosphorus on the distribution of arsenic in the soil and absorption of arsenic by the plant.

The survey initiated in 1957 will be continued on a more extensive basis in 1958. Only sites on which arsenic has not been applied to the current crop will be included in the survey. Data from the soil and plant samples obtained in the survey will aid in determining the residual arsenic levels in soils used for flue-cured tobacco production and in estimating the magnitude of arsenic absorption from the soil.

Work initiated in 1957 on methods for analyzing soils and plants for arsenic will be intensified. Preliminary investigations have indicated the need for a method that is more reliable and reproducible than is now available and one that is adaptable to the large number of samples that are to be analyzed. When satisfactory methods have been achieved, the soil and plant samples collected in 1957 and 1958 will be analyzed.

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7/1/57)

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6. Budget Plan:

| | |
|---------------------|---------|
| Salaries | \$2,500 |
| Expendable Supplies | 300 |
| Permanent Equipment | 200 |
| Overhead | |
| Other | |
| Total | \$3,000 |

7. Anticipated Duration of Work: Two years

8. Facilities and Staff Available:

Soils Department, North Carolina State College

C. B. McCants, Leader

W. G. Woltz, Cooperator

W. V. Bartholomew, Cooperator

N. T. Coleman, Cooperator

J. W. Fitts, Cooperator

9. Additional Requirements:

A graduate student has been assigned to the project. This student has been assisting, on a part time basis, in the work on this project since its initiation and hence is familiar with the objectives and procedures. Additional labor will be furnished to assist in the field and laboratory work. Routine analyses will be made in the Departmental Service Laboratory.

10. Additional Information (Including relation of work to other projects and other sources of supply):

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Signature

J. W. Fitts
Director of Project Head, Soils Dept.

A. L. ...
Director of Research